Next-Lab

Next Generation Stakeholders and Next Level Go-Lab Ecosystem for Collaborative Science Education with Online Labs

Innovation Action in European Union's 2020 research and innovation programme

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Work package 1 – Outreach and Impact

D1.6 Next-Lab Overall impact on teacher organisations and connection to policy makers

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Executive summary

The aim of this public deliverable is to provide a clear insight on the overall impact the Next Lab project had on teacher organisations and policy makers.

This impact is the outcome of intensive efforts and activities that took place under the lead of European Schoolnet and with the active contribution of the WP1 partners.

When we are talking about impact, numbers are usually considered as the most trustworthy evidence of the change or advancement that is brought by a specific tool or approach. In our case, and although some numbers will be provided, focus will be given to the stories/actions/initiatives/practices behind those numbers since these are the ones that they reveal the actual path to change.

Moreover, it would have been simplistic to claim that the Go-Lab Ecosystem and the WP1 efforts alone are solely responsible for the positive outcomes presented in this deliverable. The path to change is a complicated one, but we can state with confidence that the Go-Lab Ecosystem and the work presented in this report have contributed to the positive outcomes to be presented.

In Section 1 information on the methodology used and the main sources of data that we took into account are provided.

Section 2, which is actually the longest, presents the work that was done with the teacher organisations and offers reflections on the achieved outcomes. For the teacher organisation, information on the communication activities performed is provided but concrete example of activities that followed these actions are also provided. The positive impact on the policy makers is then presented in a structured way while the main strategies regarding policy making are presented providing examples of actions that were implemented.

Both sections reflect on the strategy followed and its outcomes aiming to provide future projects with tips that can assist in activities of this type.

Contents

Introduction

As we are reaching the end of the 3rd year of the Next-Lab project (and the 7th year of the Go-Lab Ecosystem) we will dedicate this deliverable on exploring the impact that the project made to a sub-group of its audience.

In the course of the project, its outreach activities have been adapted and focused on primary and secondary teachers, headmasters, Ministries of Education, Teacher Training Institutions and Teacher organisations.

A complete overview of these outreach activities, the communication messages shared, and the extensive work of the Next-Lab Ambassadors are provided in D1.5 “Next-Lab dissemination and implementation activities – year 3”.

The current deliverable will focus on project’s impact on the teacher organisations and policy makers, providing not only a complete account of the actions that had an impact on the targeted audience but also reflecting on their reasons of success.

1. Methodology

1.1 Target audiences

The Next-Lab outreach activities have targeted different audiences including primary and secondary teachers, headmasters, Ministries of Education, Teacher Training Institutions and Teacher associations.

In this deliverable the impact of the Go-Lab Ecosystem to teacher organisations and policy makers will be examined. Teacher organisations is another term for describing teacher associations. Their main aim is to bring together teachers of the same or similar discipline(s) (i.e. STEM) and they protect their members' rights, income, and benefits, while ensuring that all teachers are held to high standards. Resources and training opportunities are often shared through these associations while, in a number of countries, representatives from these associations are invited to participate in public consultations and face-to-face exchanges with policy makers.

The organisational structure is stable in some countries and changing in others. England, for example, has two different associations for male and female secondary-school teachers, two different associations for male and female headmasters of secondary schools, and a separate Association of Teachers in Technical Institutions. These associations are parallel to the National Union of Teachers, which is open to any qualified teacher from nursery school to university level. The National Union has no political affiliation but is politically powerful in its own right. France, in contrast, has a wide variety of teachers' organisations, with various political leanings, but they do not get on well together and are politically less effective.

Throughout the document the term "teacher organisations" will be used to describe teacher associations and organisations in order to reflect the role they play in teachers' development but also their possible political influence.

1.2 Evidence resources

The information in this deliverable is based on the analysis and reflection on different data that have been collected throughout the project. The main sources used were:

- Communications activities targeting teacher organisations (i.e. newsletters, social media)
- 34th Science Projects Workshop in the Future Classroom Lab, November 25th- 26th 2019, Brussels (entire programme tailored on teacher organisations' needs, see Annex I)
- Brussels, 25-26 October 2019 EUN Ministries of Education STEM representatives WG (MoE STEM WG) meetings and communication memos. (see agenda in Annex II)
    - Ministries of Education - STEM Representatives Working Group, 3rd Meeting, October 5th, 2017, Brussels (session on "Next-Lab Ambassadors and Teacher Training Institutions")

  - Ministries of Education - STEM Representatives Working Group, 3rd Meeting, December 12th, 2018, Lisbon (session on “Next Lab: The Go-Lab Ecosystems status update, coming next and sustainability”)
  - Ministries of Education - STEM Representatives Working Group, 3rd Meeting, September 25th, 2019, Leuven (session on “Next Lab and the example from Georgia MoE STEM WG representative on the uptake of STEM initiatives at Ministry level”)
- Eminent conference 2018, Next-Lab session
- Online meeting and communication with the Georgian Ministry of Education (April 2019 – now)
- Online and face to face communication with the Maltese, Portuguese and Flemish Ministries of Education (2018-2019)
- WP1 partners reporting on policy impact in their respective countries (see Annex IV)

2. Impact

2.1 Teacher Organisations

Together with the Next-Lab expertise centres, Next-Lab ambassadors, Teacher training institutions and Ministries of Education, teacher organisations have played a crucial role in the outreach of the Next-Lab project. Teacher organisations have contributed both in terms of dissemination of the project activities and the Go-Lab Ecosystem, through their pre-service and in-service teacher networks, but also through the development of training activities. In order to avoid misunderstandings, this section will review the specific impact on teacher organisations, that in many cases have close interdependencies with teachers training institutions, the latter, focused in the implementation of Go-Lab.

2.1.1 Target group

Teacher organisations are European and national organisations with whom the Next-Lab partners had strong contacts prior to the project. These organisations have played a strategic role in Next-Lab's communication strategy by disseminating the Go-Lab Ecosystem with their teacher communities through their newsletters, events and conferences.

Teacher organisations include mostly teacher associations, regional/national/European institutions and other Teacher Training organisations (TTIs) that do not fall within the Next-lab's TTIs Framework. Next-Lab has regularly promoted the project activities within the above-mentioned organisations through their newsletters, events and conferences. While the role of this task was mostly expected in terms of communication, a number of collaborations have arisen mostly in terms of teacher training and liaison between projects.

This section presents the communication to the teacher associations and the activities organised for this purpose.

2.1.2 Communication & activities

Teacher associations have been part of project's regular communication via the Go-Lab newsletters and social media throughout the project. In this regard, Next-Lab has also benefited of the dissemination by European Schoolnet and Scientix newsletters, including over:

- 2600 subscribers for the Scientix Digest (biweekly)
- 3800 subscribers for the Scientix Newsletter (monthly)
- 15,800 users for Science Teachers in Europe Community
- 1,400 subscribers for the EUN Policy Makers Newsletter (monthly)
- 5,800 subscribers for the EUN Teachers Newsletter (monthly)

Figures 1 to 5 feature examples of Next-Lab related items disseminated within the different EUN channels mentioned above:

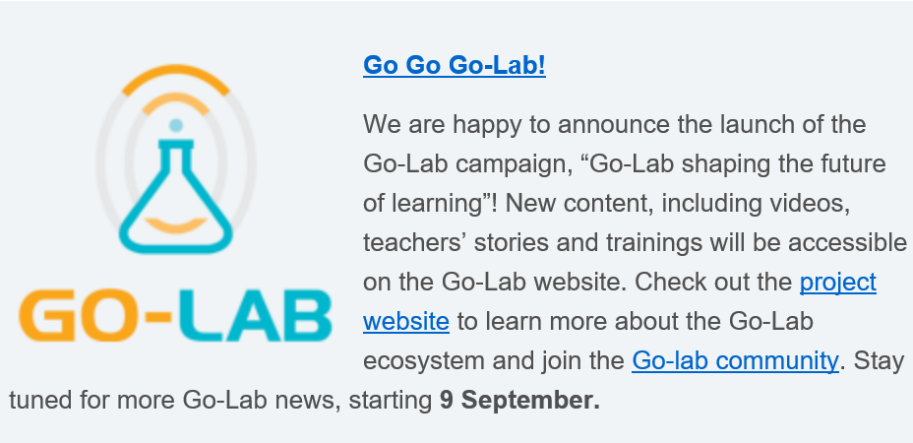

Figure 1: Screenshot - EUN teachers' newsletter (September 2019)[1]

Figure 2: Post in Science Teachers Community in Facebook (Scientix)[2]

[1] https://mailchi.mp/eun/teachers-newsletter-september2019

[2] https://www.facebook.com/photo.php?fbid=145111226772792&set=gm.2470426119837781&type=3&theater&ifg=1

Figure 3: Scientix digest[3]

Figure 4: Go-lab Sample tweet[4]

Figure 5: Go-lab Sample tweet[5]

Aside from the general communications channels, Next-Lab has also targeted teacher associations via specific project and teaching communities' collaborations and direct email targeting. The following sections provides a summary of the different types of action undertaken:

Collaboration via teacher organisation networks

- *ITELab*

In parallel to the TTIs, Next-Lab has been looking at possible ways to extend the outreach of the project, through the collaboration with ITELab[6], a Knowledge Alliance project between

[3] https://us6.campaign-archive.com/?u=fcaa73d53911340a72d92d73f&id=05fc7af7b3

[4] https://twitter.com/GoLabProject/status/1172043901538099202

[5] https://twitter.com/GoLabProject/status/1187712090993283072

[6] http://itelab.eun.org/

higher education institutions, teacher organisations and industry, aiming to foster innovation and knowledge exchange in initial/preservice teacher education (ITE).

In this regard, a webinar with ITELab was organised, where our TTI representative in Finland (UTU) presented the Next-Lab project and explained how Go-Lab has been effectively introduced into UTUs curriculum. A blog describing the TTIs Framework has also been composed: http://ite-forum.eun.org/2018/07/04/next-lab-bringing-ict-and-ibse-to-initial-teacher-education/#more-83

- *Scientix*

Scientix[7] promotes and supports a Europe-wide collaboration among STEM (science, technology, engineering and maths) teachers, education researchers, policymakers and other STEM education professionals. Through a network of National Contact Points (NCPs), Scientix reaches out to national teacher communities, and contributes to the development of national strategies for wider uptake of inquiry-based and other innovative approaches to science and maths education. In this regard, Scientix has also fostered the Friends of Scientix Community, a set of teacher associations and teacher trainers that receive regular communications in relation to Next-Lab and other science education projects to later disseminate with their teacher networks. Four teacher organisations involved in this network have attended the final teacher organisations event (described in detail within section 2.1.3 of this document).

- *Amgen Teach*

Supported by the Amgen Foundation, the Amgen Teach project[8] deepens student interest and achievement in science by strengthening the ability of life science secondary school teachers to use inquiry-based teaching strategies in the classroom. Offered in multiple languages and supporting national curricula, Amgen Teach uses training workshops and distance learning events to provide educators with the skills and confidence to spark a love of science in students. The Amgen Teach network is composed by a network of 10 training providers all over Europe[9], including universities, teacher associations and research institutes. These organisations are also part of EUNs regular communication and have received specific training & dissemination materials about the Go-Lab Ecosystems.

An example of a success story of the collaboration with the Amgen Teach project is Spain, where the local partners, the Catalan Foundation for Research and Innovation have included Go-Lab as part of their in-service teacher trainings in collaboration with our TTI in Catalonia (Universidad Politécnica de Catalunya)[10].

Furthermore, a report was developed in collaboration with the teacher organisations, *"Teacher training and IBSE Practice in Europe, A European Schoolnet overview"*[11] published by European Schoolnet and supported by the Amgen Foundation through the Amgen Teach Project that features a specific section for the Go-Lab Ecosystem (see Figure

[7] http://www.scientix.eu/

[8] http://www.amgenteach.eu/home

[9] Austria, Belgium, Czech Republic, France, Ireland, Italy, Poland, Spain and Turkey

[10] https://www.fundaciorecerca.cat/ca/sala-de-premsa/noticies/575-com-i-quines-tecnologies-emergents-estan-canviant-l-aprenentatge-de-les-ciencies-a-les-escoles

[11] Durando, M., Sjøberg, S., Gras-Velazquez, A., Leontaraki, I., Martin Santolaya, E. & Tasiopoulou, E. (2019). Teacher Training and IBSE Practice in Europe – A European Schoolnet overview. March 2019, European Schoolnet, Brussels.

6 and Figure 7). Throughout the publication, EUN shares how IBSE has proven to be an effective tool in addressing the challenge of improving STEM learning and making STEM jobs more attractive. The publication discusses the application and impact of IBSE approaches and provides selected examples of the most relevant European initiatives in STEM Teacher Training where inquiry-based strategies have been applied.

The full report is available here: http://bit.ly/Amgen-EUN-IBSE

PRESENT AND FUTURE OF THE PROJECT

The sustained and strengthened Amgen Teach activities reinforce the essential role played by teachers and IBSE, and provide invaluable resources and opportunities for teacher training and continuous professional development which results in tangible effects on the school student population.

3.b GO-LAB ECOSYSTEM

GO-LAB

The Go-Lab Ecosystem is partially funded by the European Union in the context of the Go-Lab project (Grant Agreement 317601) under the Information and Communication Technologies (ICT) theme of the 7th Framework Programme for R&D (FP7) and by the Next-Lab innovation action (Grant Agreement 731685) under the Industrial Leadership - Leadership in enabling and industrial technologies—Information and Communication Technologies (ICT) theme of the H2020 FrameworK

Under the umbrella of the Horizon 2020 European Programme, the Go-Lab Ecosystem focuses on introducing IBSE in European schools and promoting innovative teaching methods in primary and secondary schools.

The Go-Lab ecosystem provides access to online labs worldwide and trains teachers in the use of innovative teaching technologies.

THE APPROACH

Go-Lab addresses both in-service and pre-service teachers and facilitates the use of online laboratories and inquiry learning applications for science education in schools. It provides the Go-Lab Ecosystem for teachers, where various online labs can be found and used to create customised Inquired Learning Spaces.

Important elements of the project are its summer and winter schools and training workshops for Go-Lab ambassadors, which complement a free online course, "Using online labs in the classroom: an introductory course for teachers."

The common core curriculum for the project training activities is broadly defined within a competence framework which includes IBSE pedagogy, the use of the Go-Lab facility, and networking and enlargement of the community of users.

NEXT-LAB COMPETENCE FRAMEWORK

- Pedagogy / IBSE
- Use of the Go-Lab ecosystem
- 21st century skills
- Learning Assessment in Go-Lab
- Multiplication (enlarging the community of users) / communication

The overall approach to training in Go-Lab is based on the principle of subsidiarity: the National Expertise Centres and Go-Lab Ambassadors have established close links with the teachers and the Go-Lab communities in their countries, and are therefore best equipped to define and choose the training topics, as well as the type and duration of events and workshops.

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Figure 6

Each partner identifies the needs of their own teacher community and the thematic areas that are most appropriate in teacher training to facilitate the use and uptake of Go-Lab in schools.

The educational resources created within the project blend science and technology education. They allow teachers to effectively and efficiently implement practices that address various STEM areas. Numerous learning materials have been developed and extensively tested.

SCENARIOS SHAPING THE DIDACTICAL STRUCTURE OF INQUIRY LEARNING SPACES CONSIDER

- Educational objectives involved
- Characteristics of the students
- Students' prior knowledge level and the inquiry skills the students possess
- Local organizational issues.

NEXT-LAB OUTREACH

- More than 12,000 teachers
- >100 yearly training activities
- 30 countries over all Europe
- A subsidiarity principle underlies the project's actions

THE WAY FORWARD – SHARING, AUTHORING AND LEARNING PLATFORMS

The technical Go-Lab ecosystem combines cloud services and platforms. The golabz.eu sharing platform is a repository offering online labs, scaffolding apps, and Inquiry Learning Spaces created by teachers for teachers. As a suitable complement, the graasp.eu authoring and learning platform enables collaborative creation, agile personalisation, and secure exploitation at school, as well as exchange of best practices among teachers.

golabz.eu sharing platform & graasp.eu authoring and learning platform

Gillet, D., Rodríguez-Triana, M. J., De Jong, T., Bollen, L., & Dikke, D. (2017, June). Cloud ecosystem for supporting inquiry learning with online labs: Creation, personalization, and exploitation. In Experiment@ International Conference (exp. at'17), 2017 4th (pp. 208-213). Ieee

INQUIRY LEARNING SPACES (ILS) AND SCENARIOS

A number of resources for teachers are created in the form of high-end Inquiry Learning Spaces (ILS) for in-class use. A technical team is continuously developing new tools and integrating functionalities that make it easier for teachers to communicate with one another and even seek help directly from the project team. The project is therefore developing and disseminating Inquiry Learning Spaces and integrated online labs as open educational resources.

An interesting outcome of Go-Lab is the definition of scenarios that can be used to shape the didactical structure of an ILS. This scenario idea may be applicable in other teacher training projects, and is defined by a number of considerations (see box). Advanced scenario versions are being developed, building on the introductory basic scenario.

As we repeatedly point out in this document, sharing of resources and networking for cross consultation are essential ingredients for IBSE propagation within the teacher community and for fully gaining the benefits of IBSE in the student community.

Figure 7

- *spaceEU*

The aim of this project is to inspire and broaden young people's minds, develop a sense of European and global citizenship and build long-term partnerships between people from different cultural backgrounds and countries. spaceEU[12] also aims to lay the groundwork for the possible future establishment of a Knowledge Innovation Community (KIC) in the field of Space. In this regard, the project has also developed its own network of teacher organisations, that were informed regularly about the project updates and invited together with the other project above to attend a networking meeting in Brussels (more information provided in the following section).

Targeted emails

Specific emails have also been sent throughout the project targeting other teacher associations linked directly to the Next-Lab partners, with the aim not only of disseminating the Go-Lab Ecosystem and the Next-Lab activities, but also, for the organisations of

[12] http://www.space-eu.org/

webinars and networking events in collaboration with the ITELab project, the TTIs and the Ministries of Education. The following section provides further details about the end of project event.

Targeted emails have also been key for the day to day. Figure 8 shows an example of an email targeting new teacher organisations.

Dear Sir/Madam,

As your organization is involved in the promotion of Inquiry Based Learning and STEM education approaches, we would like to share with you two interesting opportunities in relation to the Next-Lab project: online webinar and invitation to the face-to-face networking meeting for teacher organization representatives taking place in Brussels, 24-25 May 2019 (travel expenses covered by the project).

The Next-Lab project (Horizon 2020) continues the activities of the Go-Lab project taking it to a next impact and innovation level. While keeping Go-Lab as the main brand, the Next-Lab project further develops the Go-Lab sharing and authoring platforms and organizes teacher-training events.

The Go-Lab Ecosystem (or the Go-Lab Sharing and Authoring Platform) targets science teachers from primary and secondary schools and aims to help them enrich their teaching practices with innovative teaching approaches and supportive technical tools.

In the scope of Next-Lab, the open authoring (Graasp) and sharing (Golabz) platforms have been enhanced with new features required by the teachers as well as by the addition of new tools for the students. For example, collaborative creation of Inquiry Learning Spaces (ILSs) are now offered, giving teachers the possibility to jointly create cross-curriculum learning scenarios. As for students, they now have the possibility to work collaboratively on their learning and research projects, enabling them to acquire 21st century skills.
In this context, the project would like to involve European teacher organizations in the promotion and dissemination of the Go-Lab Ecosystem. For this purpose we were planning the following two tailored made activities:

- An online session presenting the many benefits and possibilities of the tool:
  - Introduction to the Next-Lab project
  - Introduction to the Go-Lab Ecosystem (Sharing and Authoring Platform)
  - Translations possibilities (Apps & Labs + Graasp)
- A face-to-face networking meeting for teacher organization representatives taking place in Brussels, 24-25 May 2019.

If any of the events above is of the interest of your organization, I would kindly invite to submit your interest here:
https://forms.gle/aDJPXwuYhxsFWb8y7

Many thanks in advance for your consideration. We are looking forward to hearing from you.

Figure 8: Teacher organisations email sample

Table 1 includes a list of some of the teacher organisations that have been targeted throughout the project.

Table 1: List of teacher associations

Organisations	Country
science2school	**Austria**
Association of Biology Teachers for the French and German-speaking community of Belgium	**Belgium**
Belgian Society of Teachers of Mathematics	**Belgium**
Playful Atlas association	**Belgium**
Cyprus Chemistry Teachers Association	**Cyprus**
Cyprus Physics Teachers Association	**Cyprus**
Pancyprian Greek Teachers Organisation (POED)	**Cyprus**

Insitute of Chemistry and Technology in Prague	**Czech Republic**
Association for Science Education (ASE)	**EU**
Division of Chemical Education of the European Association for Chemical and Molecular Sciences	**EU**
European Association of Teachers	**EU**
European Mathematical Society, Educational committee	**EU**
European Physical Society	**EU**
Kindergarten Teachers Union of Finland (LTOL)	**Finland**
OAJ Vocational Educators and Trainers (OAO)	**Finland**
Organisation of Swedish-speaking Teachers in Finland FSL	**Finland**
Teacher Student Union of Finland (SOOL)	**Finland**
The Trade Union of Education in Finland, OAJ	**Finland**
Maisons pour la Science	**France**
Greece Chemistry teacher's association	**Greece**
Greece Physics teacher's association	**Greece**
Professional Development Service for Teachers (PDST)	**Ireland**
Associazione Nazionale Insegnanti di Scienze Naturali (ANISN)	**Italy**
European Association of Teachers (AEDE)	**Malta/EU**
Osrodek Edukacji Informatycznej i Zastosowan Komputerow w Warszawie (OEiiZK)	**Poland**
Warsaw Center for Socio Educational Innovation and Training (WCIES)	**Poland**
Associação de professores de matemática	**Portugal**
Sociedade portuguesa de astronomia	**Portugal**
Sociedade portuguesa de física	**Portugal**
Casa Corpului Didactic	**Romania**
Schola Ludus	**Slovakia**
Catalan Society of Chemistry	**Spain**
Centro Autonómico de Formación e Innovación (CAFI)	**Spain**
STEAMcat - Departament d'Educació	**Spain**
Ikastolen Elkartea	**Spain**
AONIA	**Spain/International**
Béta technique platform	**The Netherlands**
Kennisnet	**The Netherlands**
Nederlandse Vereniging voor het Onderwijs in de Natuurwetenschappenvoor	**The Netherlands**
Development Workshop	**Turkey**

Meram District National Education Directorate (Meram İlçe Milli Eğitim Müdürlüğü)	**Turkey**
Association of School and College Leaders (ASCL)	**UK**
National Union of Teachers (NUT)	**UK**
Primary Science Teaching Trust	**UK**

Examples of tailored activities/support

- NECs and partners activities

The Next-Lab project has always promoted the close collaboration between Next-Lab Expertise Centres (NECs), ambassadors, TTIs, teacher organisations and in general, the whole teaching community. Specific efforts have been done by partners and ambassadors to support the dissemination with the teacher organisations.

The contacts at European level have been coordinated through EUN in WP1. Next to these European organisations Next-Lab has also been in contact with a multitude of national organisations with these contacts being organised on a regional/national basis by the Next-Lab expertise centres. All dissemination efforts by the NECs (and other partners) are reported within D1.3, D1.4 and D1.5. Below you can find a sample of relevant activities targeting teacher organisations at the EU and national level:

ATEE Conference (Croatia)

The 42nd Annual ATEE Conference focuses on rapid changes and increasing complexity of today's world bringing about new challenges and growing demands on education system committed to addressing all forms of disparities and inequalities in access, participation and learning outcomes, exclusion and marginalization. The central focus of this conference is the relevance of these changing perspectives and approaches in research and practice in teacher education and teaching.

Being the largest association for teacher education in Europe, this conference provided an excellent platform for outreach within other organisations, both at EU and national level. The meeting was attended by over 500 participants and the Next-Lab project was disseminated via a presentation and the provision of leaflets.

More information available here: https://atee2017.org/node/73

9th Conference of education professionals in science (Cyprus)

Local conference about sciences for students and teachers. A brief presentation was provided about Go-Lab and its potentials, how teachers in Cyprus make use of Go-Lab so far and invitation to join Next-Lab by providing contact information.

More information available here: http://pasythe.org.cy/

Annual Chemistry Conference in Limassol (Cyprus)

A workshop was offered twice during the 3rd Annual Chemistry Conference in Limassol, Cyprus. The conference was co-organised by Cyprus Pedagogical Institute, Cyprus University of Technology, University of Cyprus and Cyprus Chemistry Teachers Society. The duration of each workshop was 1 hour. During the workshop participants were introduced to the Go-Lab Ecosystem and they were given valuable information and helpful material on how to start using it.

More presentation and the workshop slides are available here:

https://graasp.eu/spaces/5ab369e07beb703f9b318ec5

National conference "Vzděláváme s podporou digitálních technologií" (Czech Republic)

During the National conference "Vzděláváme s podporou digitálních technologií" (We are educating with the support of digital technologies) that took place in Prague. Our Portuguese expertise centre NUCLIO, organised a workshop to explain the main goals of the project, how to use Golabz, how to filter laboratories and applications, where to find a Czech translation, what the Graasp platform is, examples and possibilities of using laboratories.

More information available here: https://www.dzs.cz/cz/eun/konference-2017/

eVent 2018 - Tallinn University Digital Innovation Day - "Digital Innovation in Education" (Estonia)

eVent was a demo day organised by the Tallinn University Institute of Digital Technologies. The purpose of the event was to introduce and present various ways of enriching teaching with technological opportunities in schools, universities and the work environment. Our partner EPFL introduced participants on how Next-Lab and Graasp can support co-creation processes in IBL.

More information available here: http://htk.tlu.ee/event/

Publication "Onderzoekend leren van wiskunde met online labs" (The Netherlands)

The *Onderzoekend leren van wiskunde met online labs*[13], literally, Investigative learning of mathematics with online labs, is a magazine sponsored by the NVORWO (Nederlandse Vereniging voor de Ontwikkeling van Reken-WiskundeOnderwijs); Dutch organisation for the development of math education. Our NEC in the Netherlands (Twente University) had several small announcements in the journals of different teacher organisations.

- Ambassadors activities

Next-Lab ambassadors have proved to be excellent tools in terms of overall outreach for the project. As an example of collaboration, it is worth mentioning the developing of a chemistry digital book (featuring Go-Lab) between the ambassador, the local branch of AEDE and the Maltese Ministry of education. The full description of this collaboration may be found within the National impact sheets of this deliverable. This collaboration was also presented during the final teachers' organisations event described in the section below.

- Go-Lab campaign and IBL infographics

As part of the end of project campaign *"Go-Lab: Shaping the future of learning"* (see D1.5), EUN provided an updated version of the Go-Lab infographics developed in the first year of the project (see D1.3). A specific email was sent to all teacher organisations for the dissemination of the campaign. Materials we also made available through the project website: https://support.golabz.eu/shaping-future-of-learning-campaign

- Organisation of online webinar

[13] Van de Graaf, J., de Jong, C., & de Jong, T. (2018). Het Go-Lab. Onderzoekend leren van wiskunde met online labs. Volgens Bartjens, 37, 5, 28-31.

A webinar was organised in collaboration with ITELab, where our TTI representative in Finland (UTU) presented the Next-Lab project and explained how Go-Lab has been effectively introduced into UTUs curriculum (see Figure 9).

Figure 9: webinar screenshot

2.1.3 Teacher organisations' networking meeting

As part of the end of project campaign "Go-Lab Shaping the future of learning", the Next-Lab project organised a networking event for 16 teacher organisations all over Europe. The event took place on 25-26 November 2019 in the Future Classroom Lab (EUN offices) in Brussels. Please see within below Table 2 the teacher organisations that attended the final networking event.

Table 2: List of representatives attending the Teachers Organisations networking event

Name	Organisation	Country
Anna Monika Grzybowska	Osrodek Edukacji Informatycznej i Zastosowan Komputerow w Warszawie (OEiiZK)	**Poland**
Anna Pascucci	Associazione Nazionale Insegnanti di Scienze Naturali (ANISN)	**Italy**
Antonia Marcou	Pancyprian Greek Teachers Organisation (POED)	**Cyprus**
Christian Bertsch	science2school	**Austria**
David Vidal Lorente	AONIA	**Spain/ International**
Declan Cathcart	Professional Development Service for Teachers (PDST)	**Ireland**
Elodie Lebert	Maisons pour la Science	**France**
Erramun Martiarena	Ikastolen Elkartea / ITELab	**Spain/EU**
Eva Mateo Puig	STEAMcat - Departament d'Educació	**Spain**
Gözde Polatkal	Development Workshop	**Turkey**
Malgosia	Warsaw Center for Socio Educational Innovation and Training (WCIES)	**Poland**

Name	Organisation	Country
Margarita Porto Espinosa	Centro Autonómico de Formación e Innovación (CAFI)	**Spain**
Mehmet Eyüp Taş	Meram District National Education Directorate (Meram İlçe Milli Eğitim Müdürlüğü)	**Turkey**
Michael Mercieca	European Association of Teachers (AEDE) / Maltese Ministry of Education	**Malta/EU**
Nectara Mircioaga	Casa Corpului Didactic	**Romania**
Ondrej Simunek	Institute of Chemistry and Technology in Prague	**Czech Republic**

With the overall goal of discussing and sharing experiences in the promotion of “Inquiry Based Learning and Innovative approaches in teaching and learning”, European Schoolnet organised a two-day workshop in parallel to the final Go-Lab Ambassadors meeting. The intention was to foster the networking and collaboration between both the teacher organisation representatives and ambassadors. The full programme for this event may also be found in the Annex I.

These events are an excellent mean for dissemination (see sample tweet by one of the attendees in Figure 10). The networking of several teacher organisations allows for wider outreach that has constantly increased throughout the pre project (as reported in D1.3, D1.4 and D1.5).

Figure 10: Teacher organisation tweet during networking event

2.1.4 Reflection

Measuring the results of dissemination campaigns and engagement results is always a challenging issue. Numbers reflected in relation to website visits (Golabz.eu) and platform usage (graasp.eu) may hide other explanations for the increase (or decrease) of visits/users as described in the reflection section for the 3rd year dissemination and implementation activities D1.5. In terms of impact within teacher organisations, our experience has proved very useful the linkage of already existing initiatives, projects and networks such as ITE-Lab, spaceEU, Amgen Teach and Friends of Scientix. Combined with the national efforts (via NECs and ambassadors) and specially with the end of project campaign, the teacher organisation communication strategy has allowed for a consistent increase of outreach (in parallel to a reduction of number of activities by the partners) during the final phase of the Next-Lab project (see D1.5).

Finally, it is also worth highlighting the successful cross feedback (for a number of activities) between the teacher organisations and the teacher training institutes approach, based on the common characteristics of these two audiences:

- Both bodies are working closely with teachers (pre-service and in-service)
- The provision of support to teachers, the development of their competencies and their willingness to equip teachers with pedagogies and tools that can help them transform their teaching, are core to their missions
- They both, formally or informally, contribute to the formulation of policy by promoting the interests of their members (in the case of the Teacher associations) and students (in the case of TTIs) in relation to the skills and competences they need in order to perform their profession to high standards.

2.2 Ministries of Education (MoEs)

2.2.1 Methodology

When it comes to policy, EUN and the Next-Lab project partners have worked intensively and systematically in order to approach and influence policy makers.

EUN has used its position within its unique European forum of Ministries of Education in order to regularly communicate messages related to the implementation, development and penetration of the Go-Lab Ecosystem to the participating countries. At the same time EUN closely monitored the participating countries needs and responded promptly to its members' individual cues and requests. It is worth mentioning at this point that policy making processes vary from country to country and are subject to national priorities, needs, budgetary constraints and a wider political calendar. Under these circumstances, EUN's role has always been suggestive and responsive to its members' requests without challenging or disrespecting their policy making procedures and decisions.

Since March 2016, European Schoolnet has established and coordinates the STEM representatives Working Group (MoE STEM WG), a platform of discussion and exchange for Ministries of Education regarding their STEM education policies. The overall objective of this initiative is to help lay the foundations for medium and long-term strategies and activities in the field of STEM education, following an agenda that addresses the ministries'

priorities and main interests. The 23 members of the MoE STEM WG, from 22 countries[14], are appointed by the Ministries of Education directly. With IBL and innovative teaching being high on the already established WG agenda, the WG was kept up to date to project's developments and activities.

EUN' approach with policy and policy makers is based on its 20-year experience of working closely with Ministries of Education and on the lessons learnt through this process. As it is mentioned in "Using Evidence to Influence Policy: Oxfam's Experience", **evidence is more likely to influence policymakers when presented to them during 'windows of opportunity', when they are motivated to pay attention to and solve a problem.** With this in mind, EUN made sure to proactively keep its members up to date with Next-Lab developments, achievements and new features aiming to catch these "windows of opportunity" while they were still open. Information on Go-Lab Ecosystem's development have been shared with the MoE STEM WG in the form of informative memo's and during face to face meetings (see Annex II). At the same time, individual talks with MoEs have also provided EUN with the opportunity to further promote the use of the Go-Lab Ecosystem and present it as a possible solution to specific MoEs' needs (i.e. the Maltese MoE was looking for IBL resources and access to online laboratories which led to the inclusion of Go-Lab to their upcoming Chemistry schoolbook (see Annex III).

Another important factor for achieving policy impact is to **identify the actors with the power to change policy, and the actors able to influence policymakers.** Government ministers, their advisors, teachers, headmasters and other educational bodies have a role to play in influencing policy. Even though connections to cabinet members are powerful and important, shuffles are happening frequently, causing the movement of high-level officials to other posts. For this reason, the bottom up approach is equally important compared to the top down one in order to ensure that the use of the Go-Lab Ecosystem, its further dissemination and value is sustained and made known. To support this, EUN established the network of active Next-Lab representatives, who have already worked on supporting the project implementation, by inviting them to a 2-day workshop[15] in Brussels on 6-7 December 2019. During this workshop, this group was trained by EUN and the Next-Lab Ambassadors and received all the knowledge and tools needed in order to ensure that they will be able to continue supporting their local teacher networks in the use of the Go-Lab Ecosystem.

Moreover, and when addressing policy makers, it is important to **use a wide array of tools to communicate effectively.** Lengthy and short messages have been prepared and used depending on the occasion. These messages were usually part of trainings (face-to-face or online), emails or graphical material (i.e. Go-Lab infographic[16]).

Finally, **the messenger can be as important as the message**. It is not always either necessary or efficient to have only project partners communicating the Go-Lab results. Experience has showed us that key allies may be better placed to deliver key messages and to actually be heard. For this reason, and in the course of the project, both teachers and MoEs who are already using the Go-Lab Ecosystem have been asked to communicate their Go-Lab experiences directly with the MoEs representatives. An example of such approach was the presentation of the Georgian MoE STEM WG representative to the other members of the MoE STEM WG. During this presentation which took place during the last

[14] Austria, Belgium (Flanders & Wallonia), Czech Republic, Denmark, Estonia, Finland, France, Georgia, Greece, Hungary, Israel, Italy, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Serbia, Spain, Turkey

[15] http://www.scientix.eu/spw35-at-fcl

[16] https://twitter.com/GoLabProject/status/944145520259424256

MoE STEM WG meeting (25/09/2019, Leuven, Belgium), the Georgian representative presented how the MoE is using Go-Lab, the set of ILSs they are developing to fit with their curriculum and how they are testing the platform with their network of pilot schools aiming to scale it up in the years to come. More information about the MoE related activities per year is provided within D1.3, D1.4 and D1.5.

2.2.2 Policy related results

On country level, different actions have been implemented either by EUN or Next-Lab partners aiming to raise policy making interest on different levels. In Annex III we provide detailed descriptions of all the activities that led to positive results, while below, an overview of the nature of these results is presented.

Textbooks

The Go-Lab Ecosystem has been included in the textbooks of Greece and Malta. In Greece, EllinoGermaniki Agogi has been invited to co-author the book of Physics for the 2nd class of Lyceum. This led to the inclusion of various Go-Lab ILSs and labs to the specific textbook which is also available as a digital resource[17].

In the case of Malta, the Maltese Ministry of Education is currently in the process of moving from paper to digital books. During this process, the Education Officer for Chemistry who was aware of EUN's involvement and work with Go-Lab has approached EUN asking for recommendations on chemistry online laboratories that could be part of the next textbook. EUN brought into these exchanges the Next-Lab Ambassador to Malta (coordinated by EUN) who is now a member of the authoring team and is making sure that Go-Lab is used as the main tool for teaching IBL. Various chemistry laboratories are also part of the textbook which will be available to schools in 2020.

Pre-service & in-service teacher trainings

In addition to the work done and results delivered by the Next TTIs network (see D1.5 for more details) the Go-Lab Ecosystem has also been included in the pre-service and in-service training programmes of Estonia, Greece, Cyprus, Georgia and the Basque countries (Spain). In these cases, initial contact has been established either directly via the partners (i.e. Cyprus, Basque countries) or via the Next-Lab network of Teacher Training Institutions (i.e. Greece).

An exceptional case is that of the Basque countries were the Department of Education of Basque government funds the training of STEM in-service teachers in the use of innovative pedagogical approaches and the use of technology in the classroom. Under this framework and in the last four years (starting from the 2017-2018 school year), University of Deusto has received funding in order to design and deliver teacher training in the use of the Go-Lab Ecosystem.

In addition, the Georgian Ministry of Education has worked on the development of different ILS per subject that will later on be used for as parts of teacher training programmes.

[17] http://ebooks.edu.gr/new/classcoursespdf.php?classcode=DSGL-B

Finally, in Portugal, the close collaboration of NUCLIO with the Ministry of Education (Department of ICT), has led to the development of an accredited CPD for teachers.

Connection to national curricula

In Estonia, the cooperation of the University of Estonia with the Ministry of Education led to the development of a new national science test for primary school children that better reflects the evaluation of scientific inquiry skills. The test is computer-based and its development was guided by the Go-Lab inquiry-based learning framework as described in the article "Phases of inquiry-based learning: Definitions and the inquiry cycle" (https://doi.org/10.1016/j.edurev.2015.02.003). In that article, a flexible inquiry framework was developed as part of the Go-Lab project which is composed by five general inquiry phases: 1) Orientation, 2) Conceptualization, 3) Investigation, 4) Conclusion, and 5) Discussion. These phases currently form the foundation of a basic ILS. For the new national science test in Estonia, these phases helped to form categories from which different inquiry skills could be tested.

Another action originating from the Estonian Ministry of Education, focuses on the development of general competencies in upper secondary schools. The aim is to specify definitions and dimensions of different general competences and develop assessment measures and interventions to improve these competences. One of the competences, the science and mathematics competence, also integrates the Inquiry-Based Learning Framework developed in Go-Lab and applied in the Next-Lab project. This action is financed by the Estonian Ministry of Education and Research to support the development of new measures to apply the Estonian national curriculum.

In Georgia, the Georgian Ministry of Education follows a more Go-Lab Ecosystem-based approach and it is focusing its efforts on the development of groups of ILSs per subject. These ILSs will be integrated to the curriculum of a group of pilot schools as part of their curriculum with the aim to scale up this approach to all Georgian secondary schools.

Resources repositories

The Flemish Ministry of Education and Training has been following closely the development of the Go-Lab Ecosystem. The EUN team has provided members of the Klascement site with a training on the use of the Go-Lab Ecosystem (at the end of the Go-Lab project), and the team is eager to add it to the Klascement site. KlasCement is an educational portal site of the Flemish Ministry of Education and Training. Teaching materials are shared on the website. Teachers and students who follow a teacher training course share all kinds of self-created educational resources (such as courses, lesson plans, presentations, videos, photos, exercises and software). Organisations and projects that develop educational material for education can also post their material on KlasCement.

European Schoolnet Board of Directors Resolution

Ministries represent the decision-making body of European Schoolnet through a number of groups, including the Board of Directors. The Board of Directors in composed by Ministries of Education Representatives from: Belgium, Poland, Sweden, Italy, France, Norway, Portugal and it is responsible for deciding the overall strategy and vision of the organisation.

At the end of the Next-Lab project, the Board of Directors have unanimously released its resolution regarding the use of the Go-Lab Ecosystem and its sustainability. The aim of this resolution is to support the sustainability related activities of the project and underline the importance of guaranteeing the openness and accessibility of the Go-Lab Ecosystem. In the text that can be found in Annex IV European Schoolnet and its Ministries of Education share the belief that the Go-Lab Ecosystem is an excellent tool for the introduction of inquiry-based science education (IBSE) in schools and the promotion of innovative and interactive teaching methods in primary and secondary schools. In this regard, European Schoolnet and its Ministries of Education will continue doing their outmost for the outreach and implementation of the project activities. On the other hand, European Schoolnet and its Ministries of Education strongly support the free access of teachers to the Go-Lab Ecosystem and the continuation for EU Funded initiatives encouraging the promotion of IBSE and innovative approaches for teaching and learning.

2.2.3 Country Results

In this section, we attempt to strengthen the impact of the Go-Lab Ecosystem with country specific information extracted directly from the system. Attention is given not only to the number of teachers per country but also to the available ILSs per country. The presence of local support in the form of a Next-Lab project partner or Ambassador is also of interest since their presence might affect the overall impact on the specific country.

Table 3 Schools, ILS and local Next-Lab support per country

Country	Number of schools	ILSs in country language	Next-Lab partner /Ambassador present
Albania	7	0	n/a
Austria	5	50	n/a
Belgium	23	51 (NL), 62 (FR)	Fatiha Baki (Next-Lab Ambassador)
Brazil	73	138 (PT)	n/a
Bulgaria	13	4	Svetla Mavrodieva (Next-Lab Ambassador)
China	13 (Universities)	0	n/a
Croatia	90	6	Ivana Gugic (Next-Lab Ambassador)
Cyprus	86	121	University of Cyprus
Czech Republic	22	2	Helena Lazarova (Next-Lab Ambassador)
Denmark	3	2	n/a
Estonia	44	26	University of Estonia

Finland	124	16	University of Turku
France	90	62	University of Lyon
Germany	19	50	Jörg Haas (Next-Lab Ambassador)
Hungary	3	1	Doina Otilia Filep (Next-Lab Ambassador
Israel	84	0	Stella Magid (Next-Lab Ambassador)
Italy	168	31	Stefano Macchia (Next-Lab Ambassador)
Latvia	54	0	Ilze Smate (Next-Lab Ambassador)
Lithuania	35	3	Rigonda Skorulskiene (Next-Lab Ambassador)
Malta	6	280 (EN)	Geraldine Fsadni (Next-Lab Ambassador)
Mongolia	37	0	n/a
Portugal	274	138	NUCLIO
Romania	230	103	Lidia Ristea (Next-Lab Ambassador)
Russia	73	7	n/a
Spain	32	72	Deusto University
Sweden	14	1	n/a
Switzerland	35	62 (FR)	Philippe Kobel (Next-Lab Ambassador)
The Netherlands	15	51	University of Twente
Turkey	32	9	Erkan Akar (Next-Lab Ambassador)
UK	7	280 (EN)	University of Leicester
Ukraine	7	18	n/a
United States	187	280 (EN)	n/a

Table 3 provides a brief but not exhaustive overview of the main countries that are represented within the Go-Lab Ecosystem.

More non-European countries including Ecuador, India, Indonesia, Jamaica, Japan and Mexico, are also represented within the system by small groups of teachers. It is worth noticing at this point that these countries, even without the presence of local support, have managed to sustain Go-Lab user groups. The dissemination of the Next-Lab partners to these countries, no matter how brief it was, was nevertheless effective. This strengthens the WP2 claim that face-to-face training remains the most efficient way of addressing teachers.

When it comes to the provision of local support, countries with Next-Lab partner or Ambassador presence seem to have larger and more active, in terms of ILSs development, teacher communities. Countries without local support though are not doomed. The United States, Mongolia and Russia for example have large teacher communities that manage to benefit from the system. The Next-Lab investment in terms of the provision of online support, development of support material (i.e. MOOC, videos) proves to be efficient.

2.2.4 Reflection

When it comes to Ministries of Education and policy making, a lot of efforts have been put into communicating to them the benefits of using the Go-Lab Ecosystem in teaching IBSE and innovative approaches for teaching and learning. Communication channels and messages have been adapted taking into account Ministries' individual needs, priorities and political calendar. Workshops, online meetings, face to face meetings, memos, newsletters and personalised trainings have been carried out by European Schoolnet and the WP1 partners on various occasions.

The results of these actions have taken different forms, ranging from the inclusion of the Go-Lab ecosystem and online laboratories to school textbooks (Greece, Malta) to the adoption of the Go-Lab inquiry cycle to the general competencies test for secondary students in Estonia. Go-Lab has been included to the curriculum of many TTIs while the Georgian Ministry of Education is developing sets of subject related ILSs soon to be tested with a group of pilot schools.

Although the uptake of the Go-Lab Ecosystem by policy makers has been gradual, the results presented in section 2.2.2 form a solid set of good practices, demonstrating the various ways in which the Go-Lab Ecosystem can support primary and secondary education but also pre and in-service teachers training.

Conclusions

Measuring the impact of the Next-Lab project to teacher organisations and policy was based not only on numbers but mostly on actions, activities and policy initiatives.

In terms of impact within teacher organisations, experience has proved that the linkage of already existing initiatives, projects and networks such as ITE-Lab, spaceEU, Amgen Teach and Friends of Scientix was very effective. Combined with the national efforts (via NECs and ambassadors) and specially with the end of project campaign, the teacher organisation communication strategy has allowed for a consistent increase of outreach during the final phase of the Next-Lab project (see D1.5).

When it comes to Ministries of Education and policy making, intensive efforts have been put into communicating to them the benefits of using the Go-Lab Ecosystem in teaching IBSE and innovative approaches for teaching and learning. Communication channels and messages have been adapted taking into account Ministries' individual needs, priorities and political calendar. With this in mind, workshops, online meetings, face to face meetings, memos, newsletters and personalised trainings have been carried out by European Schoolnet and the WP1 partners on various occasions.

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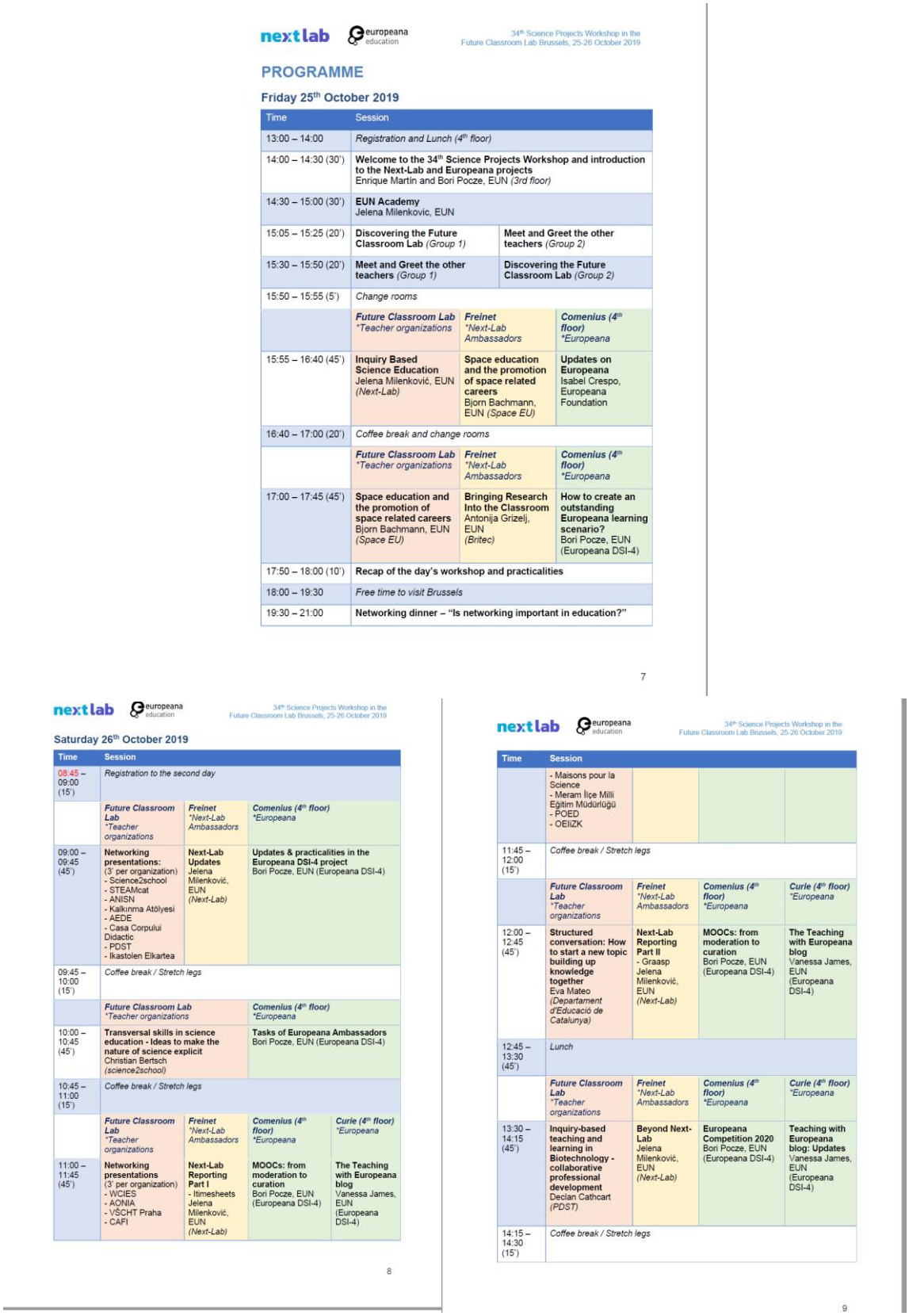
Although the uptake of the Go-Lab Ecosystem by policy makers has been gradual, the results presented in this deliverable provide a solid and inspiring set of good practices, demonstrating the various ways in which the Go-Lab Ecosystem can support primary and secondary education but also pre and in-service teacher training. It is the wish of the consortium that all these practices will provide inspiration to more stakeholders and policy makers so that the Go-Lab ecosystem will continue to offer its services to the educational community long after the completion of the Next-Lab project.

Annex I



nextlab europeana education

34th Science Projects Workshop in the Future Classroom Lab Brussels, 25-26 October 2019

PROGRAMME

Friday 25th October 2019

Time	Session		
13:00 – 14:00	*Registration and Lunch (4th floor)*		
14:00 – 14:30 (30')	**Welcome to the 34th Science Projects Workshop and introduction to the Next-Lab and Europeana projects** Enrique Martin and Bori Pocze, EUN *(3rd floor)*		
14:30 – 15:00 (30')	**EUN Academy** Jelena Milenkovic, EUN		
15:05 – 15:25 (20')	**Discovering the Future Classroom Lab** *(Group 1)*	**Meet and Greet the other teachers** *(Group 2)*	
15:30 – 15:50 (20')	**Meet and Greet the other teachers** *(Group 1)*	**Discovering the Future Classroom Lab** *(Group 2)*	
15:50 – 15:55 (5')	*Change rooms*		
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*
15:55 – 16:40 (45')	**Inquiry Based Science Education** Jelena Milenković, EUN *(Next-Lab)*	**Space education and the promotion of space related careers** Bjorn Bachmann, EUN *(Space EU)*	**Updates on Europeana** Isabel Crespo, Europeana Foundation
16:40 – 17:00 (20')	*Coffee break and change rooms*		
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*
17:00 – 17:45 (45')	**Space education and the promotion of space related careers** Bjorn Bachmann, EUN *(Space EU)*	**Bringing Research Into the Classroom** Antonija Grizelj, EUN *(Britec)*	**How to create an outstanding Europeana learning scenario?** Bori Pocze, EUN (Europeana DSI-4)
17:50 – 18:00 (10')	**Recap of the day's workshop and practicalities**		
18:00 – 19:30	*Free time to visit Brussels*		
19:30 – 21:00	**Networking dinner – "Is networking important in education?"**		

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nextlab europeana education

34th Science Projects Workshop in the Future Classroom Lab Brussels, 25-26 October 2019

Saturday 26th October 2019

Time	Session			
08:45 – 09:00 (15')	*Registration to the second day*			
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*	
09:00 – 09:45 (45')	**Networking presentations:** (3' per organization) - Science2school - STEAMcat - ANISN - Kalkınma Atölyesi - AEDE - Casa Corpului Didactic - PDST - Ikastolen Elkartea	**Next-Lab Updates** Jelena Milenković, EUN *(Next-Lab)*	**Updates & practicalities in the Europeana DSI-4 project** Bori Pocze, EUN (Europeana DSI-4)	
09:45 – 10:00 (15')	*Coffee break / Stretch legs*			
	Future Classroom Lab **Teacher organizations*		***Comenius (4th floor)*** **Europeana*	
10:00 – 10:45 (45')	**Transversal skills in science education - Ideas to make the nature of science explicit** Christian Bertsch *(science2school)*		**Tasks of Europeana Ambassadors** Bori Pocze, EUN (Europeana DSI-4)	
10:45 – 11:00 (15')	*Coffee break / Stretch legs*			
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*	***Curie (4th floor)*** **Europeana*
11:00 – 11:45 (45')	**Networking presentations** (3' per organization) - WCIES - AONIA - VŠCHT Praha - CAFI	**Next-Lab Reporting Part I** - ttimesheets Jelena Milenković, EUN *(Next-Lab)*	**MOOCs: from moderation to curation** Bori Pocze, EUN (Europeana DSI-4)	**The Teaching with Europeana blog** Vanessa James, EUN (Europeana DSI-4)

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nextlab europeana education

34th Science Projects Workshop in the Future Classroom Lab Brussels, 25-26 October 2019

Time	Session			
	- Maisons pour la Science - Meram İlçe Milli Eğitim Müdürlüğü - POED - OEIIZK			
11:45 – 12:00 (15')	*Coffee break / Stretch legs*			
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*	***Curie (4th floor)*** **Europeana*
12:00 – 12:45 (45')	**Structured conversation: How to start a new topic building up knowledge together** Eva Mateo *(Departament d'Educació de Catalunya)*	**Next-Lab Reporting Part II** - Graasp Jelena Milenković, EUN *(Next-Lab)*	**MOOCs: from moderation to curation** Bori Pocze, EUN (Europeana DSI-4)	**The Teaching with Europeana blog** Vanessa James, EUN (Europeana DSI-4)
12:45 – 13:30 (45')	*Lunch*			
	Future Classroom Lab **Teacher organizations*	***Freinet*** **Next-Lab Ambassadors*	***Comenius (4th floor)*** **Europeana*	***Curie (4th floor)*** **Europeana*
13:30 – 14:15 (45')	**Inquiry-based teaching and learning in Biotechnology - collaborative professional development** Declan Cathcart *(PDST)*	**Beyond Next-Lab** Jelena Milenković, EUN *(Next-Lab)*	**Europeana Competition 2020** Bori Pocze, EUN (Europeana DSI-4)	**Teaching with Europeana blog: Updates** Vanessa James, EUN (Europeana DSI-4)
14:15 – 14:30 (15')	*Coffee break / Stretch legs*			

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Annex II

SCIENTIX

MoE STEM WG- 3rd Meeting
05 October 2017 Agenda.

PROGRAMME

Time	Session
09:00 – 09:15 (15')	Registration
09:15 – 09:25 (10')	**Welcome** by Marc Durando
09:25 – 09:40 (15')	**Tour de table**
09:40 – 10:00 (20')	**Update on Scientix and today's meeting** by Agueda Gras • The Scientix Portal • Science Projects Workshops in the Future Classroom Lab • Scientix Networking Events • Scientix 3rd MOOC
10:00 – 10:05 (5')	**Priority 1**: STEM in primary education
10:05 – 10:20 (15')	Results of proposal, discussions in basecamp, plan for publication on STEM in primary (<5' presentation + Q&A and discussion) by Marina Jimenez-Iglesias
10:20 – 10:25 (5')	**Priority 2**: The limited information on careers for STEM graduates
10:25 – 10:35 (10')	STEM careers MOOCs. Done and coming next (<5' presentation + Q&A and discussion)
10:35 – 10:50 (15')	Coffee break
10:50 – 11:30 (40')	Collaboration of Scientix with the STEM Alliance (<10' presentation + Q&A and discussion) by Maite Debry: • STEM Professional Go Back To Schools scheme, • Teacher discovery placements: conditions of success and needed supporting structure
11:30 – 11:35 (5')	**Priority 3**: Results from projects
11:35 – 11:55 (20')	1) Press notes / Short videos; 2) Update from Next-Lab: Go-Lab Ambassadors and Next Labs Teacher Training Institutes (<10' presentation + Q&A and discussion)
11:55 – 12:00 (5')	**Priority 6**: Scientix supports the dissemination of national initiatives
12:00 – 12:10 (10')	The STEM Discovery Week 2017 & 2018
12:10 – 12:20 (10')	The Scientix Teachers Panel

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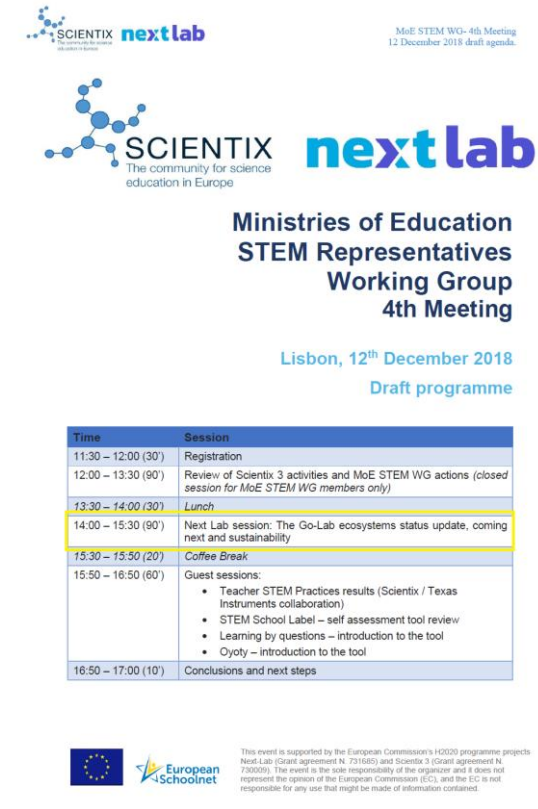


SCIENTIX nextlab

MoE STEM WG- 4th Meeting
12 December 2018 draft agenda.

SCIENTIX
The community for science education in Europe

nextlab

Ministries of Education STEM Representatives Working Group 4th Meeting

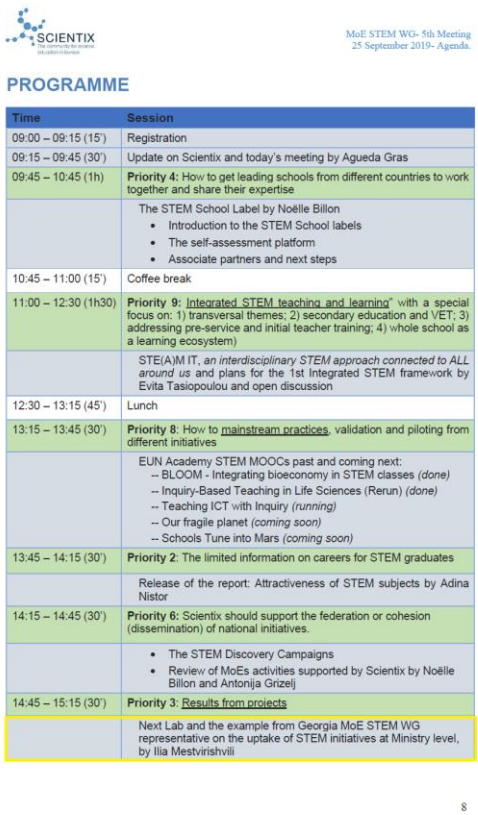
Lisbon, 12th December 2018

Draft programme

Time	Session
11:30 – 12:00 (30')	Registration
12:00 – 13:30 (90')	Review of Scientix 3 activities and MoE STEM WG actions *(closed session for MoE STEM WG members only)*
13:30 – 14:00 (30')	*Lunch*
14:00 – 15:30 (90')	Next Lab session: The Go-Lab ecosystems status update, coming next and sustainability
15:30 – 15:50 (20')	*Coffee Break*
15:50 – 16:50 (60')	Guest sessions: • Teacher STEM Practices results (Scientix / Texas Instruments collaboration) • STEM School Label – self assessment tool review • Learning by questions – introduction to the tool • Oyoty – introduction to the tool
16:50 – 17:00 (10')	Conclusions and next steps

European Schoolnet

This event is supported by the European Commission's H2020 programme projects Next-Lab (Grant agreement N. 731685) and Scientix 3 (Grant agreement N. 730009). The event is the sole responsibility of the organizer and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.



SCIENTIX

MoE STEM WG- 5th Meeting
25 September 2019- Agenda.

PROGRAMME

Time	Session
09:00 – 09:15 (15')	Registration
09:15 – 09:45 (30')	Update on Scientix and today's meeting by Agueda Gras
09:45 – 10:45 (1h)	**Priority 4:** How to get leading schools from different countries to work together and share their expertise
	The STEM School Label by Noëlle Billon • Introduction to the STEM School labels • The self-assessment platform • Associate partners and next steps
10:45 – 11:00 (15')	Coffee break
11:00 – 12:30 (1h30)	**Priority 9:** Integrated STEM teaching and learning" with a special focus on: 1) transversal themes; 2) secondary education and VET; 3) addressing pre-service and initial teacher training; 4) whole school as a learning ecosystem)
	STE(A)M IT, *an interdisciplinary STEM approach connected to ALL around us* and plans for the 1st Integrated STEM framework by Evita Tasiopoulou and open discussion
12:30 – 13:15 (45')	Lunch
13:15 – 13:45 (30')	**Priority 8**: How to mainstream practices, validation and piloting from different initiatives
	EUN Academy STEM MOOCs past and coming next: -- BLOOM - Integrating bioeconomy in STEM classes *(done)* -- Inquiry-Based Teaching in Life Sciences (Rerun) *(done)* -- Teaching ICT with Inquiry *(running)* -- Our fragile planet *(coming soon)* -- Schools Tune into Mars *(coming soon)*
13:45 – 14:15 (30')	**Priority 2**: The limited information on careers for STEM graduates
	Release of the report: Attractiveness of STEM subjects by Adina Nistor
14:15 – 14:45 (30')	**Priority 6:** Scientix should support the federation or cohesion (dissemination) of national initiatives.
	• The STEM Discovery Campaigns • Review of MoEs activities supported by Scientix by Noëlle Billon and Antonija Grizelj
14:45 – 15:15 (30')	**Priority 3**: Results from projects
	Next Lab and the example from Georgia MoE STEM WG representative on the uptake of STEM initiatives at Ministry level, by Ilia Mestvirishvili

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Annex III

Table 4 Country policy impact: Cyprus (University of Cyprus)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	The NEC in Cyprus has approached the Cyprus Pedagogical Institute (CPI) which is an organisation under the services of the Cyprus Ministry of Education, Culture, Sport and Youth. The CPI's main mission is to ensure that teachers of all levels are constantly informed about current trends in education. Moreover, the CPI substantiates research and theoretical evidence of the educational policy and facilitates teachers' professional and personal development. Specifically, CPI focuses on the following key aspects: - In-service primary and secondary school teacher training through several compulsory and optional seminars - Educational research and evaluation studies - Keep up with and inform the education in Cyprus about current trends in pedagogy - Promotion of the use of ICT tools in education - Creation and publication of books of educational interest, design and production of teaching materials and publication of textbooks. The CPI's Department of Educational Technology implements professional development programmes regarding information and communication technologies (ICT) research and practice and promotes its use in the classroom. At the same time, it provides pedagogical and technical support facilitating the effective use of ICT.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	In October 2018, we had approached key personnel of the Department of Educational Technology of the CPI and informed them about the Go-Lab Ecosystem. The first communication was made by phone and then we exchanged several emails. In November 2018 a face-to-face meeting was organised in the CPI in which we presented the Go-Lab Ecosystem to the staff members of the Department of Educational Technology. The presentation lasted approximately 30 minutes and then we had one more hour to train a representative of the Department. Our

	communication and collaboration with the Department of Educational Technology of the CPI continues until today and includes mainly email exchanges, phone calls and if needed face-to-face meetings.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	The main outcome of our collaboration with the CPI is that it became an official Next-Lab Teacher Training Institute (TTI) and one representative participated in the Next-Lab's 2nd TTIs meeting in Brussels (29-30 of November 2018). Moreover, after our first face-to-face meeting, Go-Lab Ecosystem has been included in the CPI's programme, titled Innovative Schools. This programme aims to promote the use of ICT tools in the classroom and the participated schools attend several training workshops and other meetings to include such tools in their teaching practice. In this context, two Go-Lab training workshops were offered by the CPI, one in Limassol (16 of January 2019/9 participants) and one in Nicosia (17 of January 2019/38 participants). The description of these workshops can be found on the official website of the programme Innovative Schools (https://innovativeschools.pi.ac.cy/education-2018-2019). The CPI also participated in the Go-Lab winter school in Cascais, Portugal (5-8 of March 2019) as a Next-Lab TTI. After this meeting, they expressed their willingness to continue offering Go-Lab training workshops and promote Go-Lab as an innovative tool that can be used in the context of the Innovative Schools programme. For the current school year, two more Go-Lab training workshops have been organised (https://innovativeschools.pi.ac.cy/education-2019-2020) in collaboration with our group, one in Nicosia (26 of November 2019/17 participants) and one in Limassol (28 of November 2019/16 participants).
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	We will continue our close collaboration with CPI and we will support their efforts to train in-service teachers in relation to the Go-Lab Ecosystem.

Table 5 Policy impact: Spain (Basque countries) (Deusto University)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	Next-Lab team of the University of Deusto has long-term cooperation with the Department of Education, Basque government. The Dept. of Education is educational policy institution on the Province level. We also collaborate with the foundation "FCRi: Fundacio Catalana per la Reserca i la Innovacio supports", Barcelona.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	In 2013, we introduced the Go-Lab project, firstly, with face-to-face meeting. The workshop, organised for representatives of the Dept. of Education and schoolteachers, had followed the meeting. The first communication with FCRi was conducted via email.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	The Department of Education of Basque government funds training of STEM teachers in the use of innovative pedagogical approaches and technologies in the classroom. In the last four years (including the school year 2017-2018), UD has received funding to train teachers in the use of the Go-Lab Ecosystem. The foundation "FCRi: Fundacio Catalana per la Reserca i la Innovacio supports", Barcelona, supports summer School for the STEM teachers. The school is active during last three year providing 3-day workshop on co-creation and implementation of the inquiry-based science learning over Go-Lab Ecosystem scaffold.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	After project lifetime, the University of Deusto team will organise the training actions with support of both institutions. In frame of this action, the both institutions will issue the professional development certificate for participated teachers that accepted by the authorities.

Table 6 Policy impact: Estonia (University of Estonia)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	We have approached two main policy making bodies/institutions: 1) the Institute of Education at the University of Tartu, and 2) the Estonian Ministry of Education. The Institute of Education provides research-based, pre-service training for teachers, special education teachers, speech therapists, and social pedagogues. There is also an extensive in-service training programme for teachers, heads of schools, and university teaching staff. There are about 1000 pre-service studying at the Institute of Education and about 3500 in-service teachers each year participate in professional development activities organised by the Institute. The Estonian Ministry of Education is responsible for, among other things, the planning of education, research, and managing pre-primary, basic, general upper secondary, vocational secondary, higher, hobby and adult education. The Ministry of Education is responsible for the national curriculum and for monitoring the quality of education in Estonia.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	We discussed with teaching staff at the Institute of Education where and how Go-Lab could be integrated into teacher training courses. The main areas in which Go-Lab was agreed to be most useful for the teaching staff were related to inquiry-based science education, digital competence, and collaborative learning. We met with officials at the Ministry of Education and introduced to them the Go-Lab inquiry-based approach. We highlighted how this approach could improve national science tests because of its clear focus on inquiry skills.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	Our cooperation with the Institute of Education resulted in the integration of Go-Lab in the teaching of three pre-service teacher education courses: SVHI.01.005 Inquiry Learning, SVHI.01.056 Teaching and Reflection, and SVHI.06.024 Collaborative Learning. The first course, Inquiry Learning, targets future science teachers and extensively integrates the Go-Lab inquiry-based theoretical learning framework with practical applications to create inquiry learning spaces. Thus, in this course, university students become proficient in teaching

	following an inquiry-based approach and embedding various Go-Lab apps and labs to support optimal science learning. The course Teaching and Reflection includes pre-service teachers who are not necessarily subject-specific science teachers. In this course the use of Go-Lab is first emphasized as a convenient way to organise a digital lesson. One reason for making a digital lesson includes better support for inquiry-based science learning, but other reasons can be using Go-Lab as a means for making learning interesting for students and also Go-Lab as a way to develop students digital competences. The Teaching and Reflection course prepares participants to create learning spaces, although there is less emphasis on science-specific apps. Of course, students who are training to become science teachers can explore these apps on their own time, and since the course involves a homework assignment where students must create a digital lesson and present it to their peers, then subject-specific teachers often do embed apps related to formulating hypotheses. Finally, the course Collaborative Learning also integrates Go-Lab. It does so by first presenting students with a task in Go-Lab that they must solve collaboratively. Students are organised in pairs and work with so-called asymmetric collaborative labs. These labs divide information between two learners in such a way that the task can only be solved successfully if both learners share their information. After this collaborative task the students learn how to create their own digital learning spaces and how to co-create a digital learning space with their peers. Our cooperation with the Ministry of Education led to the development of a new national science test for primary school children that better reflects the evaluation of scientific inquiry skills. The test is computer-based and its development was guided by the Go-Lab inquiry-based learning framework as described in the article “Phases of inquiry-based learning: Definitions and the inquiry cycle” (https://doi.org/10.1016/j.edurev.2015.02.003). In that article, a flexible inquiry framework was developed during the Go-Lab project to categorize five general inquiry phases: 1) Orientation, 2) Conceptualization, 3) Investigation, 4) Conclusion, and 5) Discussion. These phases currently form the foundation of a basic inquiry learning space. For the new

	national science test in Estonia, these phases helped to form categories from which different inquiry skills could be tested. Another project involving the Ministry of Education deals with the development of general competencies in upper secondary school. The aim of the project is to specify definitions and dimensions of different general competences, develop assessment measures and interventions to improve these competences. One of the competences - science and mathematics competence - also integrates the Inquiry-Based Learning Framework developed in Go-Lab and applied in Next-Lab project. The project is financed by the Estonian Ministry of Education and Research to support the development of new measures to apply Estonian national curriculum.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	Our support and encouragement to teaching staff at the Institute of Education to use Go-Lab will continue and likewise we will continue to work with the Ministry of Education in promoting the Go-Lab inquiry-learning framework throughout various science and teaching related national projects. More visibility for the Go-Lab theoretical foundation of inquiry-learning in Estonia will reinforce the importance of the teacher training courses at the University of Tartu, which in turn prepare and support more teachers to apply Go-Lab in regular teaching practice. Finally, the results of national science tests offer ample data for us to research and analyse, and from this data analysis it will be possible to identify which inquiry skills teachers should most focus on developing in their students.

Table 7 Policy impact: Greece (EllinoGermaniki Agogi)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	EA has been in contact and working with: • The Institute of Education Policy (IEP) and its regional school counsellors. IEP is a scientific agency that provides support to the Minister of Education, Research and Religious Affairs on issues regarding primary and secondary education, post-secondary education, transition from secondary to higher education, teacher training, student dropout and early school leaving. Co-operation with

	I.E.P. is required for every relevant initiative or action taken by the Ministry of Education, Research and Religious Affairs departments or the agencies supervised by it. • TTIs: University of Athens, University of Thessaloniki, and University of Aegean. • The Hellenic Physical Society (EEF) is a non-profit scientific association representing Greek scientists in physics, physics and communication technologies and other related disciplines. Its purpose is to promote the use of Physics and IT Technologies, and it contributes to the development of scientific research and education in the Natural Sciences in Greece. EEF offers training to help the general public to understand and become familiar with the issues of Physics. EA has co-organised several trainings with EEF. • Scientix / Greece is part of the European Scientix network and promotes and supports a Europe-wide collaboration among STEM (science, technology, engineering and maths) teachers, education researchers, policymakers and other STEM education professionals. Together with Greek Scientix Ambassadors, EA has organised several trainings all over Greece.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	• Discussions with IEP were made that lead to the inclusion of Go-Lab ILSs and activities in a textbook of physics for the 2nd class of Lyceum. EA was tasked to co-develop the textbook and proposed to include specific experiments and labs. • Training of pre-service teachers in the above mentioned TTIs / universities. • With EEF and Scientix several face-to-face meetings were held, and common teacher training workshops were organised.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	• Inclusion of Go-Lab into a text-book for physics for the 2nd class of Lyceum. • University of Athens - training of 25 pre-service teachers and ILS creation University of the Thessaloniki: 3 hands-on presentations in conferences. 2 master's degree theses (one developed 6 ILS and the second 2); training on Go-Lab of 30 teacher trainers (selected by the Greek ministry) in the official platform (http://moodlepake.cti.gr) who

	are now responsible for training 5000 in-service teachers) University of Aegean: Training of 61 pre-service teachers and 62 in-service teachers • More than 15 workshops with more than 200 in-service teachers were co-organised with EEF and Scientix all over Greece.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	EA is happy to continue collaborating with all institutions to promote the use of Go-Lab. As of this moment, no further concrete activities are planned.

Table 8 Policy impact: Finland (Turku University)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	In Finland we have not been in direct contact with the Ministry of Education, but we have been in contact with institutions on other levels that, although not policy makers in the literal sense, have an influence on school and classroom policies through their own policies and activities. On a national level we have been in contact with LUMA Centre Finland (network of Finnish universities to promote STEM education) and Matemaattisten Aineiden Opettajien Liitto (MAOL, association for mathematics teachers) and on lower level with institutions on the municipality level (e.g. Turku, Raisio, Tampere). On a 'horizontal' level there has been contact with another TTI (Jyväskylä) both through the Finnish and Cypriot NEC.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	For the national level organisations LUMA and MAOL contacts were with the organisers of their national conferences and concerned workshops to be organised for the teacher and university staff attending these conferences. As such their interest was mainly concerning providing program content for their target audience and not further collaboration. During the MAOL conference a university lecturer from the University of Jyväskylä attended the session, and it was agreed to set up a meeting in Jyväskylä in combination with the people from the AdaptGuide project and JYU has since become an external TTI. TTI's, through their influence on future teachers, have an impact of local school policies in the future.

	The first municipality was Tampere where Go-Lab was presented during a 4 hour workshop around the broader framework of including inquiry learning in the classroom. This experience learned that these organisations have access to teachers, but at the same time that such short time workshops are not in themselves ideal for getting people on board. The second was with Top-Keskus in Turku. Top-Keskus is 'institute' that as its main aim supports teachers' use of ICT in education. The meeting was a dedicated face to face workshop to show how Go-Lab could fit within this aim. One of their staff members attended the spring school in Tarttu, but in the end the outcome was that they were offering use of their facilities, but not adopting Go-Lab directly in their program. A side effect was however that it strengthened the relation with the school were this staff member works (on a leave of absence while at Top-Keskus), which resulted in the collaboration that is described in more detail D5.5 and that is also featured in the one page leaflet. The third was with the Raisio municipality, and the contacts originated through a graduating former student of our TTI, who participated in a Go-Lab workshop during his studies. Based on this contact a workshop was organised in August 2019 just before the start of the school year. This was an important experience as it revealed that this is the kind of event and the timing where paid training workshops can be organised in the sustainability framework. The fourth and the second in Turku collaboration was with the STEAM Turku project. The objectives of the project are (among others) to create a new education operating model for the City of Turku for increasing the attractiveness of science and technology, and to build a science and technology path combining early childhood, basic and upper secondary level education in the city. The City of Turku Education Division is responsible for implementing the project, but it links into the entire city's industrial policy. There had been already a side contact with the project when they provided grants for replacing the teachers attending the Tarttu spring school, but after that the collaboration became more direct, when the STEAM Turku project manager helped us to reach teachers of Turku to invite us to give exemplary Go-Lab lessons and training in their schools.

What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	The intention of the Finnish project team is to use the model piloted in Raisio in the fall of 2019 to offer further Go-Lab training events in the fall of 2020. The idea is to offer training events on municipality level as part of these larger training events taking place at the beginning of the school year. These events gather together a majority, or in ideal cases all, teachers from said municipality and thus offer an excellent opportunity for promoting Go-Lab. We will also use the Aurajoki school in these future trainings as a case example to showcase a path that schools can follow with the aim of establishing inquiry-learning as permanent part of the school's curriculum. The school will first be introduced to inquiry-learning and Go-Lab as part of the training events at the beginning of the school year, then encouraged to apply for Erasmus+ K1-funding to attend Go-Lab training events. Finally, the trained teachers will be encouraged to establish a teacher group focused on implementing inquiry-learning on a wider basis as part of the school's curriculum. The University of Turku will also continue as a TTI, and we are currently discussing ways to elaborate and strengthen ICT in education courses within the Department of Teacher education based on this years' experience and the experiences with the exemplary lessons. In the following year the aim is to develop ILSs directly anchored in the Finnish curriculum in the same way that it was done in one exemplary case this year: develop the ILS based on the Finnish curriculum, initial review by pupils, adjust to the feedback, implement in a classroom, adjust after the implementation and publish it in the Go-Lab portal. This kind of model serves as a multi-edged sword, it provides meaningful education experiences for the students.

Table 9 Policy impact: Netherlands (University of Twente)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	Our main focus was to present Go-Lab by means of presentations and workshops on conferences organised by influential organisations and teacher organisations in The Netherlands. For instance on the Research conference organised by NRO and Kennisnet. The Netherlands Initiative for Education Research (NRO) contributes to innovation and improvements in education by coordinating and funding educational research and by facilitating the connections between educational practice and research. Kennisnet is the public organisation for Education & ICT. They provide a national ICT-infrastructure, advise the sector councils and share their knowledge with primary and secondary education as well as vocational education and training. Together with the sector counsels they enable the educational sector to realize their ambitions with ICT.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	Workshops were given for the following teacher organisations: • The working group didactics of Physics (Dutch: Werkgroep Natuurkunde Didaktiek). • The working group didactics of Chemistry. • Vereniging NLT (Nature, Life and Technology). NLT is an integrated science and mathematics subject, which has been introduced in secondary education in the Netherlands in 2007. • NVORWO (Nederlandse Vereniging voor de Ontwikkeling van Reken-Wiskunde Onderwijs) Dutch organisation for the development of math education.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	This has not led to concrete plans of action. However, in October 2019 a coordination group of teachers and school leaders has presented a plan for a revision of the curriculum of primary and secondary education to the minister of education (see

	www.curriculum.nu). In this plan there is more attention for digital literacy and research skills. One of the objectives in this curriculum for instance is: “Students learn to formulate research questions, to do systematic research, to interpret observations and to relate these to scientific concepts”.

Table 10 Country policy impact: Portugal

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	NUCLIO is working with the department of the Ministry of Education devoted to ICT. They are the regular contact point for EUN.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	NUCLIO presented Go-Lab to various members of the department including the General director of education. Members of the department received training in Go-Lab summer schools and also had the opportunity to participate in training events formally conducted in Portugal.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	NUCLIO has signed a collaboration agreement with this department. They regularly announce Go-Lab events and opportunities in their regular news to schools and endorsed all the activities we conducted in the various schools with whom we collaborated. NUCLIO, as a certified training centre, presented and had approved a training course to the specific body and accredits the CPD for teachers. These courses are relevant for their progression in their careers.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	NUCLIO will continue providing CPD accredited courses to teachers in Portugal and integrating the use of the ecosystem as a mean to showcase the power of the ecosystem to the Ministry of Education. Several important changes are taking place in Portugal, in particular in terms of curriculum flexibility and inclusion actions. NUCLIO is planning to showcase to the specific department how the Go-Lab ecosystem is contributing to the materialization of this vision and request that the Ministry of Education disseminates these ideas more strongly to headmasters. We expect to integrate this strategy in the consultancy

	actions NUCLIO is planning to provide to schools.

Table 11 Policy impact: Malta (European Schoolnet)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	EUN has been in touch with the Maltese Ministry of Education, via its Ministries of Education STEM representatives working group and the Science Centre, which is part of the Directorate for Learning and Assessment programmes covering the various STEM disciplines.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	EUN has been informed by the Science Centre Education officer for Chemistry that the Ministry was planning to develop digital textbooks for the various subjects starting from Chemistry. The Education officer has been informed, via EUN's Ministries of Education STEM representatives working group, regarding the Go-Lab Ecosystem and he was interested in including it in the textbook. EUN provided information and some suggestions on ILSs and labs that could be interesting and at the same time ne brough the Education Officer in touch with the Next-Lab Ambassadors for Malta who shortly became part of the authoring team.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	Various ILSs and labs from Go-Lab Ecosystem are currently being added to the new and digital Chemistry textbook that is expected to reach Maltese schools in September 2020. The Next-Lab Ambassador for Malta is also part of this process which includes the entire Chemistry teachers' community.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	EUN remains in touch with the Science Centre and is ready to provide any further support needed by the Ministry.

Table 12 Policy impact: Georgia (European Schoolnet)

Country policy impact

What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	The Georgian Ministry of Education, the National Center for Teacher Professional Development (http://tpdc.gov.ge/eng/), the Millennium Challenge Account – Georgia (http://www.mcageorgia.ge/) and the American Academy in Tbilisi.
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	The Georgian Ministry of Educations has received information on the use of the Go-Lab Ecosystem via EUN's Ministries of Education STEM representatives working group. They have asked EUN for further information and training which has taken place remotely, by the EUN team, on 2 different occasions. The Ministry has then proceeded in the development of a set of ILSs tailor made to secondary education needs. During this process EUN provided ad hoc support and advise to the MoEs related to the development of good ILSs and the identification of the appropriate labs.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	The Ministry of Education has produced more than 30 ILSs for their network of pilot schools, and they are planning to scale up the use of Go-Lab on national level. The Go-Lab Ecosystem and apps have been translated in Georgian.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	EUN remains in close touch with the Georgian Ministry of Education in order to support the scaling up of the Go-Lab Ecosystem use.

Table 13 Policy impact: Serbia (European Schoolnet)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	The Serbian Ministry of Education
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	The Serbian Ministry of Education has been informed, via EUN's Ministries of Education STEM representatives working group, regarding the Go-Lab Ecosystem and have requested additional information on its use and application. EUN provided information and research data on the impact of the tool which led the MoE to the decision of including the tool to its curriculum. The entire document (308 pages) is at EUN disposal.

What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	Go-Lab Ecosystem has been added to the Serbian curriculum and it is recommended as a tool to be used for teaching Inquiry Based learning.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	EUN remains in touch with the Serbian Ministry of Education via its Ministries of Education STEM representatives working group and will see with the MoE is further support can be provided on national level.

Table 14 Policy impact: Belgium (European Schoolnet)

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	Flemish Ministry of Education
Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	The Flemish MoE has requested to receive personalised training on the use of the Go-Lab ecosystem. Two EUN has visited their offices in Brussels and provided that training while answering various questions about the content and technical capacities of the tool
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	The Flemish is looking adding the tool and some of its laboratories to Klascement, an online repository where teachers can find but also share educational resources.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	EUN remains in close contact with the Flemish MoE in order to support this specific action in any requested way.

Table 15 Policy impact: North Macedonia

Country policy impact	
What type of policy making body/institution have you approached? Please provide information on its role and policy influence (i.e. Ministry of Education, regional/local government, educational policy institution etc.)	North Macedonia Ministry of Education

Provide detailed information on the course of action you have adopted in order to approach and engage the previously mentioned body/institution (i.e. face to face meeting, tailor made workshop, presentation etc.)	EUN has received information from the Ministry of Education in North Macedonia and the Fund for Innovation and Technological Development, regarding the “Young researchers” call and the need for further disseminating it. The call was open to all primary and secondary schools in the country, which could submit entries with innovative research projects. Information has been shared via different EUN channels and the North Macedonia Next-Lab Ambassador has decided to apply herself with a project proposal based on the Go-Lab Ecosystem.
What were the main outcomes of your action? (i.e. follow up meeting, formal or informal integration of Go-Lab Ecosystem to formal/informal curriculum, integration of Go-Lab Ecosystem to schoolbook/official communication, funding etc.	The project "Air quality in my classroom" submitted by "Stiv Naumov" school in Bitola with a contribution from Silvana Ristevska, Next-Lab ambassador for North Macedonia was announced one of the best 20 projects. The project is currently underway, and it will be made available to all schools under the curation of the North Macedonia Ministry of Education.
What are the follow up activities/developments that will further support your action in the immediate future (if any)?	

Annex IV

NEXT·LAB·PROJECT·–·SUSTAINABILITY·¶

RESOLUTION·OF·THE·BOARD·OF·DIRECTORS·OF·EUROPEAN·SCHOOLNET¶

Since· 2007,· European· Schoolnet· and· its· network· of· ministries· of· education· have· inscribed· STEM· education· development· as· one· of· their· priorities.· European· Schoolnet· is· engaged· in· developing· projects· and· initiatives· supporting· ministries· of· education· regarding· the· disinterest· of· young· students· to· take· up· STEM· studies· and· STEM· jobs.· In· that· context,· European· Schoolnet· has· been· involved· in· more· than· 30· different· STEM· education· related· projects,· to· develop· and· test· innovative· approaches· and· provide· specific· recommendations· and· evidence· to· its· network· of· ministries· of· education,· on· which· they· can· develop· specific· policy· recommendations.¶

The· Next-Lab· project· is· implemented· under· European· Union's· Horizon· 2020· programme.· Coordinated· by· the· University· of· Twente· in· the· Netherlands,· the· project· was· launched· on· the· 1st· of· January· 2017· and· will· be· over· by· the· end· of· 2019.· The· Next-Lab· project· builds· on· the· activities· of· the· Go-Lab· project.· While· keeping· Go-Lab· as· the· main· brand,· the· Next-Lab· project· further· develops· the· Go-Lab· sharing· (Golabz)· and· authoring· platforms· (Graasp)· and· reaches· out· to· primary· schools,· teacher· organizations· and· Teacher· Training· Institutions.· In· the· scope· of· Next-Lab,· the· open· authoring· and· sharing· platforms· have· been· enhanced· with· new· features· for· teachers· and· students.· For· example,· collaborative· creation· of· Inquiry· Learning· Spaces· (ILSs)· are· now· offered,· giving· teachers· the· possibility· to· jointly· create· cross-curriculum· learning· scenarios.¶

EUN· is· work· package· leader· for· "Outreach· and· Impact"· but· is· also· closely· involved· within· the· "Empowering· Teachers"· and· "Coordination· and· Sustainability"· tasks.· In· this· regard,· EUN· is· currently· coordinating· a· network· of· 19· Ambassadors,· the· Teacher· Training· Institutes· (TTIs)· Framework· (34· universities· are· currently· involved· in· the· programme· and· 17· of· them· have· already· implemented· Go-Lab· within· their· curriculum)· and· the· overall· partners· implementation· activities.· Two· teacher· competitions· have· been· organized· during· the· STEM· Discovery· Week· (2018-2019),· several· international· workshops,· online· sessions· and· ad-hoc· activities· supporting· involvement· at· the· national· level.· EUN· has· also· been· responsible· for· the· development· of· qualitative· case· studies,· targeting· teachers· and· schools.·¶

The· sustainability· of· the· project· has· been· right· from· the· start,· a· top· priority· for· the· consortium.· In· this· regard· EUN· has· taken· the· following· actions:· the· communication· and· involvement· of· the· policy· makers· through· the· Ministries· of· Education· STEM· representatives· working· group;· the· inclusion· of· the· Go-Lab· eco-system· within· several· workshops· (e.g.· an· international· training· course· on· "Enhancing· STEM· practice· and· strategy· in· secondary· schools");· the· Next-lab· ambassadors,· whom· are· also· Scientix· Ambassadors· (this· dual· role· will· facilitate· the· continuation· of· their· Next-Lab· outreach· activities· and· their· contact· with· the· EUN· team);· and· finally· the· TTIs,· with· the· majority· of· TTIs· committed· to· continue· using· the· Go-Lab· eco-system· after· the· end· of· the· project.·¶

The· STEM· Education· MoE· Working· Group,· composed· by· 23· Ministries· from· 22· countries· (Austria,· Belgium· (Flanders),· Belgium· (Wallonia),· Czech· Republic,· Denmark,· Estonia,· Finland,· France,· Georgia,· Greece,· Hungary,· Israel,· Italy,· Lithuania,· Luxembourg,· Malta,· Poland,· Portugal,· Romania,· Serbia,· Slovakia,· Spain,· Turkey)· has· always· been· informed· on· the· development· of· the· Next-Lab· project· and· has· contributed· actively· to· its· promotion.·¶

Based· on· consortium· discussions,· the· Go-Lab· Ecosystem· will· remain· publicly· available· for,· at· least,· two· years· after· the· project· has· ended· [hosted· by· three· project· partner· representatives:· University· of· Twente· (UT),· information· multimedia· communication· AG· (imc),· and· École· Polytechnique· Fédérale· de· Lausanne· (EPFL),· the· authoring· platform].· In· parallel,· the· consortium· has· been· developing· a· premium· website· offering· premium· services· and· courses,· which· would· be· on· a· paying· basis· for· teachers· (while· the· current· platform· would· remain· available· as· it· is· today).·¶

European· Schoolnet· and· its· Ministries· of· Education· share· the· belief· that· the· Go-Lab· Ecosystem· is· an· excellent· tool· for· the· introduction· of· inquiry-based· science· education· (IBSE)· in· schools· and· the· promotion· of· innovative· and· interactive· teaching· methods· in· primary· and· secondary· schools.· In· this· regard,· European· Schoolnet· and· its· Ministries· of· Education· will· continue· doing· their· outmost· for· the· outreach· and· implementation· of· the· project· activities.· On· the· other· hand,· European· Schoolnet· and· its· Ministries· of· Education· strongly· support· the· free· access· of· teachers· to· the· Go-Lab· ecosystem· and· the· continuation· for· EU· Funded· initiatives· encouraging· the· promotion· of· IBSE· and· innovative· approaches· for· teaching· and· learning.·¶

Done·in·Brussels·on·19·November·2019¶